Project No. 20-24(20) COPY NO. XXX

STRATEGIC PERFORMANCE MEASURES FOR STATE DEPARTMENTS OF TRANSPORTATION

A HANDBOOK FOR CEOS AND EXECUTIVES

FINAL REPORT

Prepared for
National Cooperative Highway Research Program
Transportation Research Board
National Research Council

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June 2003

ACKNOWLEDGEMENT OF SPONSORSHIP

This work was sponsored by the American Association of State Highway and Transportation Officials, in cooperation with the Federal Highway Administration, and was conducted in the National Cooperative Highway Research Program, which is administered by the Transportation Research Board of the National Research Council.

TABLE OF CONTENTS

Acknowledgements

The research reported herein was performed under NCHRP Project 20-24 (20) by TransTech Management, Inc. Dr. John Cameron, Managing Partner, was the principal investigator for this project. Other authors of the report are Joe Crossett, Manager and Craig Secrest, Senior Manager. The work was conducted under the general supervision of Dr. Cameron. The authors gratefully acknowledge the assistance and contributions of the following individuals who provided numerous insights, examples, and other information in support of the project.

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Abstract

A guide for CEOs and senior managers in state DOTs on how to develop strategic performance measures. Strategic performance measures link together strategic planning and performance measurement to translate organizational vision into a small group of measurable, meaningful, and accurate performance measures. Only a handful of DOTs, however, fully integrate performance measurement with their strategic management efforts. They offer compelling evidence that performance measures are more than merely a way to track progress. Indeed, strategic performance measurement can be the catalyst for energizing strategic management efforts, maintaining focus, and enabling organizational change. The four key building blocks for establishing a strategic performance measurement program and reaping these benefits are: basic principles, criteria for measure selection, the choice of individual measures, and an implementation framework. The report walks readers through each of these steps, drawing on actual experiences in several DOTs.

SECTION 1:

Linking Strategic Management & Performance Measurement

"The secret for success in strategic performance management is strong leadership"

Douglas McDonald, Secretary, Washington State DOT

State departments of transportation (DOTs) are charged with ensuring cost effective design, construction, and operation of safe and efficient multi-modal transportation systems that underpin the social and economic fabric of the communities they traverse, all while preserving or enhancing environmental quality. This is a complex mission!

To help their agencies define and perform these challenging responsibilities, DOT Chief Executive Officers (CEOs) and senior management increasingly are turning to *strategic management* and *performance measurement*. These valuable business-planning tools are closely related, yet in many cases, they are not applied in a complementary manner.

- **Strategic management** encompasses a range of planning activities used to identify important agency-wide goals and objectives and then work towards achieving them. Some strategic management efforts involve development of formal plans that document vision, mission, goals and objectives; other efforts may be more impromptu in nature.

- **Performance measurement** efforts often are narrowly focused on tracking inputs or outputs of individual day-to-day business elements. A DOT may utilize hundreds of measures, yet lack good information about overall agency performance.

Strategic performance measurement links strategic management and performance measurement, establishing a connection between strategic goals and the results of day-to-day business processes, but without the need to track hundreds of different measures. Strategic performance measures are fewer in number and they typically address complex agency-wide objectives, such as better mobility or improved safety that involve multiple stakeholders and coordination across DOT functions. Translating organizational vision into a small group of measurable, meaningful, and accurate performance measures is at the heart of the strategic performance measurement challenge.

Only a handful of DOTs, however, integrate performance measurement with their strategic management efforts. The evidence from those that do offers a compelling case that performance measures are more than merely a way to track progress. Indeed, strategic performance measurement can be the catalyst for energizing strategic management efforts, maintaining focus, and enabling organizational change.

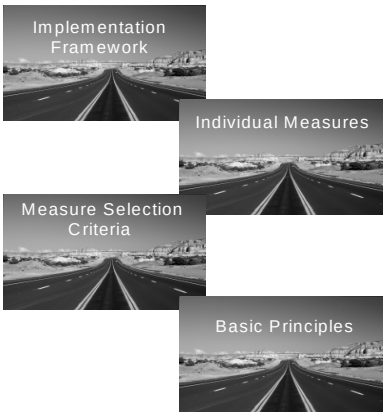
Transportation agency leaders considering implementation of strategic performance measures should be willing to make a sizeable commitment in terms of time and management philosophy. This handbook offers guidance to senior DOT executives on how they can use performance measures to translate a desire to lead into success in managing organizational change. It draws on the lessons learned from states with a proven track record in strategic performance measurement.

Handbook Organization

This handbook is organized around four building blocks for establishing a strategic performance measurement program:

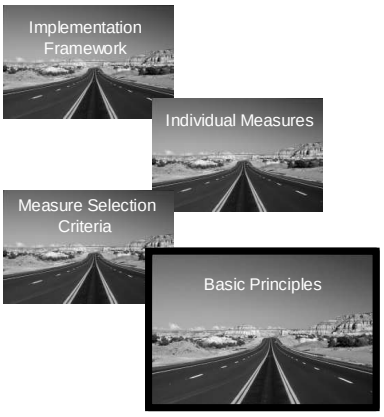
- **The *Basic Principles* Building Block –** provides an understanding of basic principles of strategic performance measurement;
- **The *Measure Selection Criteria* Building Block –** gives hints on creating a set of strategic performance measures;
- **The *Individual Measures* Building Block –** examines candidate measures states can use; and
- **The *Implementation Framework* Building Block –** explains how to create and use a performance measures framework.

Throughout the handbook, key points are highlighted using actual examples from state DOTs. Appendix A provides a detailed listing of strategic performance measures used by selected DOTs. Appendix B provides a selection of references for further reading. Appendix C provides a glossary of acronyms and abbreviations used in the handbook.



SECTION 2:

Basic Principles Building Block



"Performance measures are a powerful tool for changing an agency's strategic direction."

Pete Rahn, Former Secretary
New Mexico State Highway Transportation Department

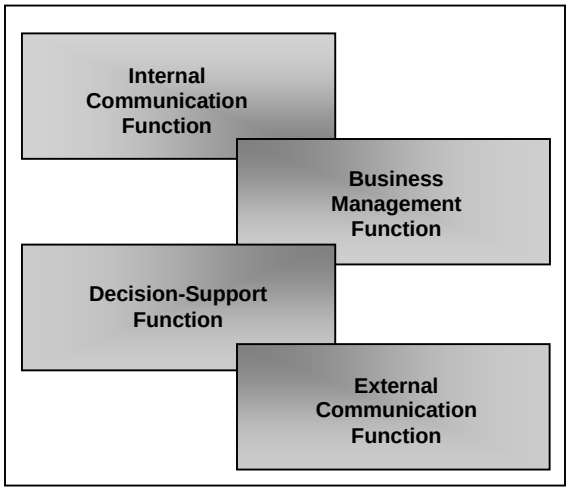
This section provides a primer on the basic principles of strategic performance measurement, including its functions, its benefits, the importance of customer satisfaction and leadership, and challenges to implementation.

2.1. Four Functions of Strategic Performance Measurement

Internal Communication Function. Strategic performance measurement can enable CEOs to communicate strategic priorities to their employees. At the New Mexico State Highway Transportation Department (NMSHTD), for example, 16 issue areas, referred to as Results, are continuously emphasized in regular performance tracking meetings that ensure managers and frontline employees focus attention and improve performance in areas of greatest concern.

Business Management Function. Strategic performance measurement can provide an organizing theme and focus point for management frameworks. At the Pennsylvania Department of Transportation (PennDOT), for example, a handful of measures that align with strategic goals form the highest level of the framework and are the drivers for division-level *Business Plans.* These measures are supported by more detailed measures in unit-level *Action Plans*. Finally, there may be hundreds of individual-level measures that are part of individual employees' *Performance Reviews.*

Figure 2.1: Functions of Strategic Performance Measurement



Decision-Support Function. Strategic performance measurement can be a planning and budgetary decision-making tool. In states that have developed integrated asset management systems, for example, decision-makers are able to use data on pavement or bridge conditions in the budgeting and planning process to help determine program needs, allocate funds, and select projects.

External Communication Function. Strategic performance measurement can help a CEO tell stakeholders and customers about the agency's priorities. Such efforts

can be critical to gaining stakeholder trust and respect, particularly as DOTs seek to obtain additional revenues; often, the measures are as important as the results. In Washington State, the Gray Book of strategic performance measures is helping strengthen external support for the Washington State Department of Transportation's (WSDOT) programs by demonstrating the agency's focus on critical stakeholder concerns.

2.2. Benefits of Strategic Performance Measurement

One obvious benefit of strategic performance measures is their ability to provide a quick barometer of organizational progress toward meeting strategic objectives. As the functions of strategic performance measurement suggest, however, there are broader benefits.

Shaping Organizational Culture. DOTs, with thousands of employees scattered across wide geographic areas, often struggle to foster positive employee attitudes toward change. The participatory and on-going nature of creating and regularly reviewing performance measures, particularly if the process involves widespread staff participation, helps create the combination of employee buy-in and accountability for strategic objectives.

At NMSHTD, development of the Compass program of strategic performance measurement has successfully focused employees' attention on improving performance in 16 key areas, addressed by 86 measures. The on-going process of developing, reviewing, and enhancing these measures, in which employees are full participants, has resulted in high levels of support that have contributed to the success of the agency in making progress towards strategic goals.

Maintaining Focus on Strategic Goals. The strategic management process usually generates a map for new organizational direction, often in the form of a formal strategic plan. Once the early, intense effort to develop strategic direction is completed, however, there is a risk that momentum will be lost and the strategic plan will simply sit on a shelf. Strategic performance measures help continually reinforce an agency's priorities by communicating those priorities to employees. Strong CEO advocacy for and participation in performance measurement efforts directly influence the extent to which performance measures help maintain strategic focus.

At the Minnesota Department of Transportation (Mn/DOT), the three cornerstones of the agency's strategic vision – *safeguard what exists*; *make the network operate better*; and *make Mn/DOT work better* – are measured using a set of 24 performance measures. Staff from across the agency contributes to the development of strategies for ensuring that results reflect progress towards attaining the agency's strategic vision. At the Louisiana Department of Transportation and Development (LADOTD), senior management uses performance measures to translate goals and objectives into program delivery priorities, and to delegate responsibility for these priorities.

Strengthening Trust with Stakeholders and Customers. Communications and maintaining favorable relations with the public and stakeholders are increasingly important DOT activities. Strategic performance measures can play an important role in communicating agency priorities and demonstrating accountability to the public.

The Pennsylvania Department of Transportation regularly communicates with stakeholders and customers about performance results for its strategic plan called Moving Pennsylvania Forward, using widely circulated and easy-to-read publications. To highlight issues of particular importance within Moving Pennsylvania Forward, the CEO regularly produces individual measure report cards for stakeholders and customers on performance trends for critical issues, such as International Roughness Index (IRI) ratings for major highways, transit funding aid levels, and rail crossing safety.

Identifying and Addressing Customer Needs. Strategic performance measurement

can help agencies identify customer needs and respond to them. Perhaps most importantly, objectives and measures that incorporate customer satisfaction considerations frequently lead managers to discover customer concerns that can be addressed without major expenditures or initiatives.

Travel safety is a top priority for the Florida Department of Transportation (FDOT), and the agency has set specific objectives for reducing highway fatalities. By communicating with customers about how to reach their targets, the Department discovered that the quality and visibility of roadway signage and pavement markings was both a perceived and real safety concern for Florida's elderly drivers. Under FDOT's Elder Roadway User Program, the agency is now moving aggressively to improve driving conditions for older motorists and helping make travel safer.

2.3. Customer Satisfaction

Perhaps the most important outcome for DOTs is customer satisfaction, and most high-level performance measures thus focus on factors that determine customer opinions. As such, customer satisfaction considerations are vitally important to every aspect of strategic performance measurement.

Using Customer Opinions to Shape Strategic Management Direction. Customer satisfaction is an important input in the development of agency goals and objectives. In particular, customer opinions about the strengths and weaknesses of a DOT and the state transportation system should influence, if not drive, an agency's goals and objectives.

At LADOTD, customer opinions played an important role in the development of the agency's goals and measures. Through interviews with a variety of stakeholders, LADOTD determined that improving its credibility with customers is a strategic priority. This led to both the development of a management goal that focuses on institutional change and the creation of objectives under several goal areas that focus on customer satisfaction.

Using Customer Opinions to Shape Individual Measure Design. In many instances, customers and agency staff view progress toward a specific goal or objective differently. Thus, customer satisfaction should be considered in the development of performance measures to ensure that measures reflect public perceptions of progress and/or good performance.

At Mn/DOT, snow and ice removal is a major maintenance responsibility that is important to customer satisfaction. To help develop a performance measure for this activity, Mn/DOT conducted market research on customer expectations that helped shape the agency's snow removal performance measure, in terms of how bare pavement is defined and in terms of adequate snow removal times.

Using Customer Opinions as Performance Measures. In addition to its importance to the development of strategic performance measurement elements, customer satisfaction can be important as a performance measure itself. In fact several DOTs now conduct regular customer surveys and incorporate the results into their annual (and sometimes quarterly) performance reports.

The Florida Department of Transportation has recognized that customer perception about the quality and cleanliness of rest stops weighs heavily on the Department's overall image. To monitor customer satisfaction with rest stops, FDOT has installed simple surveying machines at each location and asked users to register their experience with the facilities. Customers who find the facilities unsatisfactory are asked to fill out a card to identify the cause of their concerns. Data are then reviewed monthly to provide FDOT mangers with an early alert if the quality of services drops at any individual rest area.

At PennDOT, customers are surveyed on their opinions about each of the Department's Strategic Focus Areas. The results of the surveys help develop a complete picture of agency performance,

although the agency also relies on internal measures of performance. For example, in the Department's strategic focus area called Maintenance First, customers are asked to give an A through F grade for timeliness of repairs, line painting, snow removal, litter pick-up, and road signs. These measures augment internal measures for the Maintenance First focus area, such as the International Roughness Index.

2.4. Importance of Leadership and Perseverance

A CEO that expects to establish performance measures and then sit back to reap the benefits is in for a rude awakening. Leadership is fundamental to successful performance management, and CEOs should be prepared to make a major time commitment to their performance measurement initiatives.

A strong leadership commitment helps ensure broad employee support and accountability. If employees know the boss is watching, they are more likely to treat performance measures seriously! This kind of buy-in and accountability does not come free. The CEO should expect to be closely involved from the very first step of setting up a performance measures program and on an ongoing basis throughout its implementation. This means attending meetings, reading reports, identifying priorities, and communicating with employees.

Successful performance measurement programs do not occur overnight. Chief Executive Officers must allow time for results. The DOTs that are finding success with performance measures generally are harvesting the fruits of many years of experimentation. For example, PennDOT began its first strategic planning efforts in 1979. Since then, the agency's efforts have evolved from an internal focus during the 1980s to a more stakeholder driven focus during the 1990s. The most recent efforts are focused more on customers.

2.5. Challenges to Performance Measure Implementation

Chief Executive Officers and senior managers should be prepared for challenges they may encounter in the development and implementation of strategic performance measures.

Externally Imposed Requirements Can Be Onerous. Frequently, federal agencies, state legislatures, governors' offices, or central administrative agencies impose requirements on DOTs to develop performance measures. These requirements may allow flexibility, but are more often prescriptive about strategic planning or performance measurement system requirements. Sometimes the imposed requirements are inconsistent with the needs of a CEO or senior management.

Some agencies, such as the DOTs in Maryland and Louisiana, have overcome this problem through overlapping sets of performance measures – one to satisfy external requirements and one for internal management purposes. While this approach works, it increases the complexity of a DOT's performance measurement framework, requires inefficient duplication of effort, and can create confusion as to which is the right plan.

Budgetary Inflexibility Makes Acting on Results Difficult. Departments of transportation vary in their ability to influence the structure of the agency's budget or move funds from one program to another. A rigid budget structure can make it difficult to align agency budgets with priorities and performance measures. This may take several years to resolve through revisions to strategic priorities and measures, as well as statutory and administrative changes in agency budget structures. For example, when FDOT developed its first strategic plan 12 years ago, the links between the agency's strategies and budgeted program areas were awkward at best. Over time, both FDOT's strategic priorities and its budgetary structure have evolved to the point where they are now closely aligned.

Measures Expose DOTs to Greater Legal and Political Risks. Good performance measures that help CEOs manage change show where an agency is succeeding and identify where improvement is needed. Publicly reporting the latter, however, can be a risky endeavor, particularly if there is distrust or a lack of mutual respect among the DOT, elected officials, the media, and stakeholder groups. The challenge to consider is that building adequate trust and respect may take time and expose agencies to public criticism in the initial period after performance measurement implementation.

Lack of Employee Buy-in Makes Measures Ineffective. Performance measures are of little value to a CEO and senior managers if employees do not have a commitment to attaining the agency's strategic priorities and investing in the performance measurement system. At least initially, staff may resist performance measurement due to skepticism about its value, concerns about being measured, resistance to additional administrative burdens, or fear of potential change. The challenge for a CEO is to determine where barriers to employee buy-in exist and then develop an implementation approach that overcomes them.

Limits on Staff Time and Resources. Building an effective strategic performance measurement program takes significant time. Thus, significant CEO involvement and the longevity of a CEO's tenure are both critical to successful development of strategic performance measures. There also is a need for a champion authority with dedicated resources and sufficient influence within the organization. This person needs to have ample time to travel around the state, motivate employees, and prepare performance reports. All these activities take a significant commitment of time and resources.

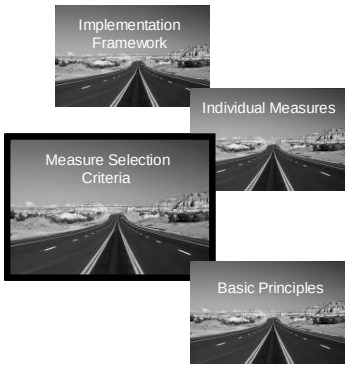
Lack of Data Collection Systems and Expertise Hinders Measurement. Successful strategic performance measurement typically requires a lot of data. While all DOTs collect significant levels of transportation system and agency operating data, existing information systems may not support many of the performance measures an agency wants to implement. In some instances, this is because the needed data simply are not available. In other cases, the data may exist, but are not in a usable format, or there is a significant lag between when an action occurs and when data about its effects are available. New data can always be collected, but it may take significant time and resources to do so.

Agencies also may lack personnel with appropriate data analysis or data management expertise. Performance measures often require significant manipulation of data to isolate the desired areas of performance. This manipulation may require staff capabilities in data mining, statistics, and econometrics that many DOTs do not possess.

Coordination Issues. Given the large size and multifaceted missions of DOTs, coordination challenges can threaten the efficiency and effectiveness of performance measure programs. Specifically, agencies should ensure a centralized approach is used to: 1) identify data needs and assign collection responsibilities; 2) establish measurement approaches; and 3) control strategic performance documents. A lack of coordination can lead to similar or redundant data collection activities by multiple offices, inconsistently applied measurement methodologies, overly burdensome data requests or surveying of partners and customers, and inconsistent or inaccurate communication of agency performance (e.g., staff speaking from different reports).

SECTION 3:

Building Block – Measure Selection



"*Adapt; don't adopt!"*

Brad Mallory, Former Secretary, PennDOT

Strategic performance measures are a means to an end – tools that help implement strategic priorities – and selecting the 'right' set of performance measures is an art more than a science. This section provides guidance on the art of selecting measures and reviews a sampling of widely applicable strategic performance measures used by state DOTs.

3.1. Getting Started – Thinking Strategically

The fashion which DOTs set strategic priorities varies. Many agencies develop strategic plans that include vision, mission and goal statements, as well as objectives. In such instances, the objectives drive the development of measures. Usually, objectives are organized around a handful of critical issues such as system preservation, customer satisfaction, management, safety, environment, economic growth, and congestion.

Alternatively, some DOTs use strategic components of their Long Range Transportation Plans to drive initial development of performance measures. In a few instances, DOTs use performance measures without any formal strategic plans. For example, at NMSHTD, performance measures serve as the agency's strategic plan, and strategic direction is established as part of an ongoing measurement development and revision process.

Two important considerations are evident from the experiences of state DOTs:

i) Start where you are. Nearly every agency has performed some level of strategic thinking in the last few years. Start from this preexisting work for both efficiency and continuity purposes, unless prior processes were totally impotent, or were received with disdain by the employees. Only in this situation might you want to start afresh.

ii) Identify where you want go. Ensure agency priorities are clearly identified. This can be either specific targets (e.g., reduce fatalities by X%) or desired trends (e.g., continuously reduce fatality rates on state highways).

3.2. Criteria for Selecting Measures

No one-size-fits-all set of strategic performance measures exists that senior managers in every DOT should use. Measures reflect unique characteristics, such as:

- Agency goals, objectives, and strategies;
- Organizational and legislative structures and responsibilities;
- Project development processes;
- Geography and climate;
- Fiscal constraints;
- Rural versus urban focus; and
- Stakeholder concerns.

The following section identifies considerations DOTs can use to guide the

selection of measures suitable for their own circumstances.

Keep the Number of Measures Manageable. Bear in mind that CEO involvement in strategic performance measurement is a critical ingredient for success; therefore, relying on fewer well targeted measures generally is better. There are, however, no hard and fast rules about the right number of measures. Some states prefer to start out by using multiple measures to gauge performance in areas of critical importance, then fine tune the number of measures later. The Maryland State Highway Administration (SHA) and NMSHTD both have around 80 measures that are reviewed on a regular basis by senior managers. Other states strive to streamline the number of measures that are reviewed at a strategic level. The Florida Department of Transportation and PennDOT use only about 15 to 20 measures to review strategic performance. Both approaches work.

Use Output or Input Measures as well as Outcome Measures. Outcome measures assess the results of a program activity compared to its intended purpose. Input measures identify the resources committed to a specific activity and output measures reflect the product of resource commitment. According to performance measurement theory, outcome measures are generally considered better than output measures, which in turn are considered better than input measures. Departments of transportation can, however, successfully use a mix of all three categories that is tailored to meet management information needs. For example, LADOTD uses a combination of clearly identified input, output, and outcome measures to hold staff accountable for attaining agency goals.

Ensure a Balanced Set of Measures. A DOT's set of strategic performance measures should reflect a balanced set of concerns. Transportation system characteristics such as pavement smoothness are important, but internal organizational performance and perspectives of customers and partners also should be measured. For example, Mn/DOT's strategic performance measures address 1) system preservation, 2) operation of the transportation network, 3) customer satisfaction, and 4) internal organizational processes. A set of measures also should reflect both processes and products. For example, the process for ensuring timely and cost efficient completion of construction projects can be as important as the products of smooth roads or adequate capacity.

Use Leading and Lagging Measures. A well-designed mix of measures enables a CEO and senior managers to monitor overall performance while operating an early warning system that ensures problems are quickly identified and addressed. Lagging measures provide after-the-fact information, such as customer satisfaction, pavement roughness, and project letting. They are useful for gauging if program or process changes are needed. Leading measures predict if the lagging measure is likely to improve, such as measures that address earlier elements in project development to ensure timely construction letting. In some instances, a few leading and lagging measures, working in combination, may be needed to ensure the desired performance is monitored and achieved.

Be Flexible About Use of Measures. State DOTs should be prepared to experiment with measures. Sometimes a measure that looks great in theory will prove unhelpful. In such cases, measures should be discarded and new measures developed in their place. In other cases, a measure may outgrow its usefulness as strategic performance needs change. Again, such measures should be discarded. In short, strategic performance measures should not be set in stone.

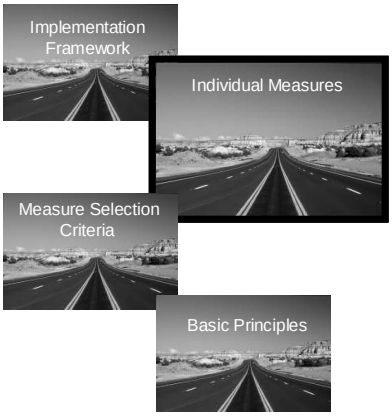
Don't Forget about Existing Data Sources. Because the use of strategic performance measures is a relatively new concept, DOTs often assume new data sources are required. In fact, it is likely that much of the data needed to support desired strategic performance measures is already being collected. In fact, there are many examples where DOTs have developed successful measurement approaches using existing data. New data sources may, however, be required for measuring some aspects of strategic performance.

Balance Data Availability and Analytic Rigor. At the outset of the strategic performance measurement process, many eager DOTs set out to create new and innovative measures that require collection of new data. While better data are always desirable, too much emphasis on complex analytic measures that require extensive collection of new data may overwhelm the process. Sophisticated measures should only be used in areas where there is a need to push the envelope. Focus first on simplicity.

Go Beyond Easily Measurable Activities. While simplicity and measurement ease is important, DOTs should not shy away from experimenting with measures that address issues that are hard to quantify or where the link between policies, procedures, and performance is not easily determined. Such measures help to focus attention on important issues, even if results may be difficult to interpret. Congestion, for example, is a critical issue for DOTs, yet what to measure remains unclear. To focus on recurring congestion at priority locations, Maryland SHA monitors the percentage of projects advertised each year that are intended to reduce recurring congestion.

SECTION 4:

Building Block – Individual Measures

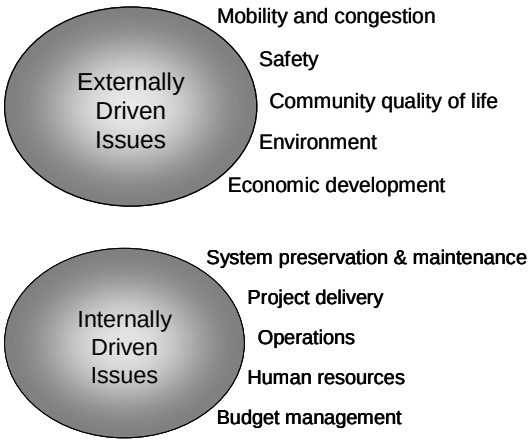


Most DOT strategic management efforts are focused around a small set of big picture issues. This section identifies these issue areas and examines the strategic performance measures that DOTs use to monitor them.

4.1 Internal Versus External Strategic Issues

Most big picture issues are either predominantly externally or internally driven.

Figure 4.1. Major Categories of Internal and External Issues



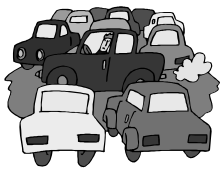
Externally driven issues are often measured using performance outcomes such as reductions in congestion or an expanded economy. While DOTs play a strong leadership role in influencing externally driven issues, these areas also are subject to other influences over which a DOT has only limited control. This makes performance measurement of externally driven issues more complex. Internally driven issues are generally subject to fewer external influences; that is, a DOT has greater control over outcomes in these areas.

4.2. Externally Driven Strategic Issues

With the exception of safety, state DOTs have not traditionally focused on collecting data for externally driven issues such as congestion, quality of life, environment, and economic development. Yet, these are key elements of most DOTs' strategic management efforts; they are issues in which DOTs often take a leadership role; and they are often of great concern to external stakeholders.

Externally Driven Issues

- Mobility and congestion
- Safety
- Community quality of life
- Environment
- Economic development



Mobility and Congestion

Most states address mobility and congestion as part of their strategic management efforts. Techniques for measuring strategic performance in the area of mobility and congestion are not well defined. Satisfactory outcome measures are still in their infancy, but input and output measures are widely used and serve a valuable role in highlighting the need for action and in demonstrating commitment.

Congestion-Related Measures. A handful of DOTs are attempting to measure actual changes in congestion, which is the desired outcome of their strategic management efforts. Sample measures include:

- **Florida –** The rate of change in person hours of delay on the Florida Intrastate Highway System (FIHS);
- **Washington –** Daily vehicle hours of delay per mile, sample commutes measured by delay, and time of day distribution of delay;
- **Pennsylvania –** Reductions in peak period work zone lane restrictions; and
- **Minnesota –** Percent of Interregional Corridor (IRC) miles meeting speed targets, and hours and miles of congestion per day.

Traffic Flow Improvement-Related Measures. More commonly, DOTs measure outputs associated with programs, such as Intelligent Transportation Systems (ITS) and traffic operations, that affect mobility and congestion. Such measures do not provide a definitive picture of congestion or mobility improvements, but they do focus attention on efforts that will likely improve conditions. Sample measures include:

- **Maryland –** Number of cumulative Coordinated Highway Action Response Team (CHART)/ITS devices installed, number of regional Traffic Operations Centers integrated with CHART, percentage of cameras available to the traveling public via the Web;
- **Minnesota –** Customer satisfaction with traveler information before and during the trip; and
- **Washington –** Incident response times and clearance times.

Capacity Expansion-Related Measures. Departments of transportation also seek to measure additional capacity that is provided to address congestion and mobility. As with technology and traffic flow-related measures, these measures do not provide a definitive picture of congestion or mobility improvements, but they do focus attention on efforts that will likely improve conditions. Sample measures include:

- **Florida –** Share of the highway capacity improvement program designated for capacity improvements on the FIHS; and
- **Maryland –** Percentage of projects intended to reduce recurring congestion advertised within the fiscal year.

Non-Single Occupant Vehicle (SOV) Mode-Related Measures. Some DOTs measure use of non-SOV modes, which may help to reduce congestion or improve mobility. Sample measures include:

- **Washington –** Park and ride lot occupancy rates; and
- **Maryland –** Percentage of centerline miles along urban State Roads that have sidewalks within 0.6 miles of a transit station.

Another generation of congestion and mobility-related measures will be required to better measure progress towards the types of strategic goals and objectives that DOTs are setting in this area. For the present, however, output and input measures that focus on policies and programs to address congestion and mobility appear to be worthwhile.

Safety

Most DOTs collect a considerable amount of data on safety. For strategic management purposes, agencies should select one or more measures that use this data. Typically, selected measures focus on crashes by type; injury, crash, or death rates; and implementation of safety improvements, using a mix of outcome and output measures.

General Fatality, Injury, or Crash Rate Measures. These measures typically are either for all highways, selected classes of highways, or increasingly, for highways and other modes, particularly pedestrians and bicyclists. They are expressed as fatalities, injuries, or crashes per unit of vehicle miles traveled (VMT) or population, or as an absolute number per year. They provide an assessment of outcomes. Typical measures include:

- **Florida –** Highway fatalities per VMT on all public roads;
- **Minnesota –** Crashes per million vehicle miles (trunk highways 3-yr average);
- **Maryland –** Percentage reduction in the number of bicyclist fatalities and injuries on state highways; and
- **Louisiana –** Percent reduction in crashes on Interstate construction projects.

Cause of Crash Measures. These measures focus on causes of crashes, reflecting crash types that are a concern to the agency. Sample measures include:

- **New Mexico –** Head-on crashes per 100 million vehicle miles; and
- **Minnesota –** Total crashes on at-grade railroad crossings (3-yr average).

Safety-Related Measures. These measures focus on implementation of safety measures. Typical measures include:

- **New Mexico –** Seatbelt use by the public; and
- **Washington –** Planned versus actual projects in the Low Cost Safety Enhancement Program.

Most states use similar safety-related strategic performance measures that are focused on measuring outcomes. Good quality data and well established performance measures have made these measures more effective.

Community Quality of Life

Community quality of life has emerged as an important stakeholder and customer concern. Departments of transportation are wrestling with approaches for measuring community-related strategic performance. Examples of currently used measures include:

- **Maryland –** Percentage of Neighborhood Conservation and Urban Reconstruction, bicycle retrofit, and sound barrier projects advertised within the fiscal year;
- **Maryland –** Number of new miles of advertised roadway that are bicycle compatible;
- **Maryland –** Percentage of sidewalk, TEA-21 Enhancement, and TEA-21 recreational trails funds programmed each fiscal year; and
- **Maryland –** Percentage of eligible urban highway mileage with sidewalks.

Environment

Departments of transportation are increasingly incorporating environment- and sustainability-related goals into their strategic management efforts. There is not, however, consistency among states in how these efforts can be measured. Measures fall into two major categories: measures of individual elements of environmental quality, such as historic and cultural resources or wetlands; and measures of environmental processes.

Natural Environment. Environmental outcomes such as air quality or water quality are often hard to define and difficult to measure, and DOTs have limited control over them. Inputs and outputs are easier to measure, but may have little impact on overall environmental quality. Sample measures include:

- **New Mexico –** Highest average readings of Environmental Protection Agency (EPA) air quality standards;
- **Maryland –** Acres of wetlands created and reforestation planted compared to acres required; and
- **Maryland –** Number of storm water management enhancements completed compared to the number targeted.

Process Improvements. Measurement of environmental process elements, such as completion times for environmental documents, is an alternative to measuring environmental impacts. Sample measures include:

- **Maryland –** Number of SHA, environmental agency and consultant staff attending Streamlining Process training sessions;
- **Maryland –** Percentage of construction projects achieving erosion and sediment control ratings of A or B;
- **Maryland –** Percentage of environmental commitments met for advertised projects each fiscal year;
- **Pennsylvania –** Number of highway project environmental approvals that are on time;
- **Pennsylvania –** Implementation of ISO 14001 environmental criteria; and
- **Louisiana –** Annual percent reduction in environmental permit violations.

Economic Development

As with environment, economic development is a strategic performance measurement focus for most DOTs. Consistency among states in how these efforts are measured, however, is not high. Sample measures include:

- **New Mexico –** Number of high paying jobs, number of licensed businesses; and
- **Maryland –** Percentage of programmed economic development projects advertised within the fiscal year.

4.3. Internally Driven Strategic Issues

Internally driven strategic issues are often directly related to state DOTs' business functions, such as maintenance and operations, design, construction, and general administration. Outcomes for these strategic issues are directly influenced by DOTs' actions. Measurement of these issues is not new, and in many cases data are readily available from financial management, project management, pavement management, or bridge management systems. The primary challenge for a DOT wishing to develop strategic measures in these areas is selecting a handful, rather than many, measures.

Internally Driven Issues

- System preservation and maintenance
- Project delivery
- Operations
- Human resources
- Budget management

System Preservation and Maintenance

The health of highways and bridges is universally recognized by state DOTs to be a critical outcome of system preservation activities. As a result, most state DOTs place a high priority on ensuring smooth pavement and safe bridges, and they are well equipped to measure their performance in system preservation since bridge and pavement management systems are already in place to collect data. Widely used system preservation indices, such as the International Roughness Index, as well as

data collected by the federal government, have helped to standardize performance measurement approaches in this area. Yet, individual state DOTs measure system preservation performance in different ways. In general, three categories of measures are widely used: Pavement Smoothness Measures; Bridge Condition Measures; and Service Life Activity.

Pavement Smoothness Measures. For strategic management purposes, states may focus on major state highways, such as National Highway System (NHS) highways or Interstates. Measures rate smoothness of pavement, either based on an external standard, such as IRI, or on an internally developed standard (usually a hybrid version of commonly established pavement smoothness measures that reflects state-level concerns). Examples of typical measures include:

- **Pennsylvania –** Change in IRI rating for major NHS highways;
- **Minnesota –** Percent of miles of pavement that meet good and poor ride quality targets (principal arterials and IRCs); and
- **Louisiana** – Percentage of the State's NHS miles rated in less than fair condition.

Bridge Condition Measures. States may adopt either federal standards that address the number of deficient or functionally obsolete bridges or similar state-level measures. Alternatively (or in addition) they may measure investment in improvements to bridges. Examples of these measures include:

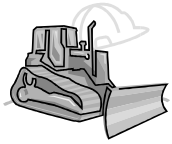
- **Florida –** Share of maintained bridges that meet Department standards;
- **Maryland –** Percentage of structurally deficient bridges on Maryland's portion of the National Highway System compared to the national level;
- **New Mexico –** Bridge replacement deck area and costs; and
- **Louisiana** – Percent reduction of deficient bridge deck area.

Service Life Activity. States also may choose to view system preservation from the perspective of remaining service life. Sample measures include:

- **Minnesota –** Remaining service life of pavement; and
- **Maryland –** Average service life of pavements.

Together, pavement smoothness, bridge condition, and maintenance activity measures have proven highly effective in allowing states to achieve and measure progress towards strategic goals in the area of system preservation. These measure are well supported by existing information management systems, results are easy to understand, and outcomes are focused.

Project Delivery



Project delivery, which includes both project development and construction, is a critical component of a DOT's core business that touches many other areas of strategic importance, such as mobility, congestion, safety, economic development, system preservation, and organizational excellence. As a consequence, many DOTs seek to measure processes related to their project development and or construction activities. Relevant measures generally focus on costs and or time, but states vary widely in how they quantify costs and time.

Cost-Related Measures. Measures used to address costs frequently focus only on construction costs, although some states estimate and monitor the total cost to develop and complete projects. Associated measures typically identify cost per day or per mile, as well as comparisons of actual versus planned costs. Sample measures include:

- **New Mexico –** Interstate and non-Interstate construction cost per lane mile;
- **Kentucky –** Actual cost versus six year plan cost; and

- **Maryland –** Reduction in average change order percent.

Construction Timeframe-Related Measures. Measures in this category relate to the number of projects completed and how long they take to develop and construct. Sample measures include:

- **Maryland –** Percentage of bids opened on date specified in bid proposal;
- **Kentucky –** Original construction contract time versus actual; and
- **Washington –** Planned versus actual advertisements.

A selection of construction-related measures that address cost and project-level timeliness can be instructive in determining progress towards strategic objectives in this area. Most of these measures are analytically rigorous, drawing on data that are collected as part of financial management or project management systems. These measures also send a clear message to employees, stakeholders, and the public about efforts to improve cost efficiency and timeliness of project construction.

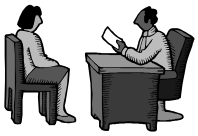
Operations

Some states focus on operations as a strategic issue. Often, issues such as litter pick-up, adequate signage and roadway markings, and satisfactory rest area conditions have been shown to significantly influence customer satisfaction. In contrast to other internally driven issues, the availability of performance data in these areas is often limited. As a result, agencies are devising new approaches to address concerns, and measures vary widely from state to state. Some examples include:

- **New Mexico –** Shoulder miles of litter pick up;
- **New Mexico –** Customer satisfaction at rest areas;
- **New Mexico –** Maintenance expenditures per centerline mile of combined system-wide miles;
- **Washington –** Achievement of biennial maintenance targets; and
- **Washington –** Planned versus actual miles of pavement striping.

This is an area of particular significance for state DOTs. Recognition of the importance of highway operations in terms of overall customer satisfaction is increasing pressure for new measures. The scientific accuracy of these measures and their relationship to outcomes is sometimes questionable, yet they undoubtedly perform a strong communications function.

Human Resources



Most DOTs' strategic management efforts focus not only on core business areas, but also on human resources issues. As with most of the other internally driven issues, data are frequently already collected, and the priority is to select measures that are representative of strategic objectives. Measurement tools generally fall into one or more of five categories, as described below.

Sick Leave/Workers Compensation-Related Measures. These measures identify lost workdays:

- **New Mexico -** Quarterly and annual comparison of sick leave hours used to total hours available, and
- **Kentucky –** Absenteeism, lost workdays, workers' compensation claims.

Hiring-Related Measures. These measures focus on DOTs' success in hiring and retaining staff:

- **Louisiana**– Annual reduction in agency-wide vacancy rate;
- **New Mexico –** Quarterly comparison of turnover rate by District/central office, and cumulatively; and
- **Kentucky -** Composite score on targets for a) time to fill vacancies, b) quality of hires, c) retention, and d) diversity.

Training. These measures focus on DOTs' capabilities for training staff:

- **New Mexico –** Training hours completed by employees by districts and divisions; and
- **Maryland –** Number of employees who have an annual development plan as part of their performance evaluation.

Safety. These measures focus on worker safety:

- **Washington –** Highway engineer workers recordable injuries;
- **Kentucky –** Occupational Safety and Health Administration (OSHA) recordable incident rate;
- **Maryland –** Percent reduction in injury rate, number of lost work days due to injury; and
- **Louisiana –** Percent reduction in crash rates at sites where safety improvements have been implemented.

Employee Satisfaction. These measures focus on employee satisfaction:

- **Pennsylvania –** Percent positive rating in organizational climate survey (goal of 48 percent by 2002).

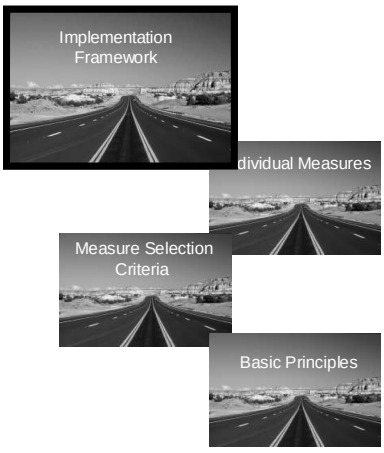
Budget Management

State DOTs are developing a variety of strategic performance measures to assess budget and financial management issues. Typical measures include:

- **New Mexico –** Comparison of contractual services to agency budget, ratio of operations to administration budget, ratio of construction to maintenance budget;
- **Maryland –** Percentage of budget expended;
- **Louisiana –** Accuracy rate for toll collection;
- **Kentucky –** Administrative cost as a percent of total expenditures, percent highway use tax collected; and
- **New Mexico –** Total annual obligations as a percent of annual Federal-aid limitation, State Program cumulative average budget and obligation, six year Statewide Transportation Improvement Plan (STIP) funding compared to needs.

SECTION 5:

Implementation Framework Building Block



> *"Use of performance measures to influence agency decisions involves much more than the measures themselves."*
>
> *Performance Measures to Improve Transportation Systems and Agency Operations,* TRB Conference Proceedings, 2001.

A cohesive performance measurement framework that is widely understood and that supports strategic objectives and the collection of results enables CEOs and senior management to:

- Organize numerous measures;
- Keep track of and interpret results; and
- Take action on results.

This section offers practical guidance to CEOs and senior management on creating and institutionalizing a strategic performance measurement framework for their organizations.

5.1. Creating a Strategic Performance Measurement Framework

Creating a performance management framework may seem like a daunting and abstract task, yet the basic elements of a framework are surprisingly simple. They include:

- A hierarchy for organizing measures;
- Annual business plans and action plans; and
- An executive-level performance measures office.

A Hierarchy of Measures
Echelons of measures keep performance measurement manageable at the senior level and relevant at subordinate levels.

Many DOTs use a hierarchical approach for organizing measures. At the top of the hierarchy is a handful of strategic performance measures on which senior management focuses its attention. These measures are supported by a number of mid-level tactical measures, and below them is an array of lower-level operational measures. When reporting of a top-tier measure raises concerns, investigating lower-level measures may identify contributing causes.

High level measures are like channel markers for ships in that they help to establish key points along the channel path, rather than mark every point in a continuous, uninterrupted line. Without a hierarchy of measures, the CEO risks creating a performance management system that is data rich, but information poor.

Florida. The Florida Department of Transportation uses a hierarchy to organize its performance measurement program. At the highest level, FDOT has three strategic

goals that support implementation of the 2020 Florida Transportation Plan (FTP):

- Goal One – Preserve and manage a safe, efficient transportation system;
- Goal Two – Enhance Florida's economic competitiveness, quality of life, and transportation safety; and
- Goal Three – Promote organizational excellence.

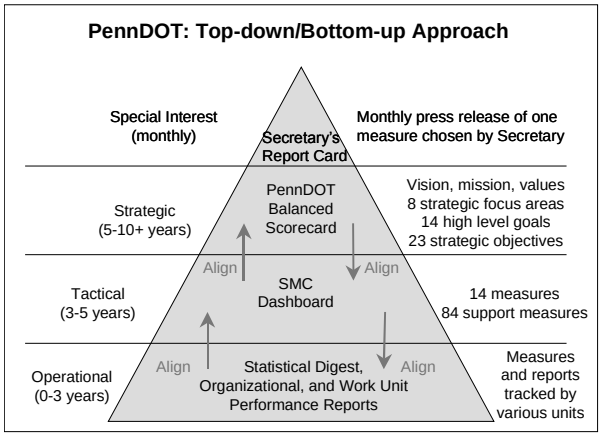
The Department has created nineteen top-level measures that are aligned with these three goals. In the area of system preservation, for example, FDOT has three top-level performance measures:

- Percent of the State Highway System that meets FDOT standards;
- Percent of FDOT-maintained bridges that meet Department standards; and
- Percent of the acceptable maintenance standard on the State Highway System.

While the FDOT management team focuses on these measures, agency operating units use numerous additional measures to keep the top-level measures on track.

Pennsylvania. Like FDOT, PennDOT has a hierarchical set of measures that are closely linked to its strategic plan, as shown below.

Figure 5.1. PennDOT's Top-down / Bottom-up Approach



Source: PennDOT

Annual Business Plans

Business plans bridge the gap between an agency's high-level strategic goals and performance measures and the diverse array of day-to-day activities of its employees. They help managers and staff focus their day-to-day activities on meeting strategic organizational goals and performance measures.

Business plans can be organized around a DOT's organizational structure. High level business plans for each division or district office are general in nature. Under a business plan, multiple action plans are developed that apply to an individual work unit within a division. The action plans provide more detailed information to guide the specific efforts of the work unit.

The primary functions of the business and action plans should be to identify at the appropriate level of detail:

- What is to be accomplished;
- Who is accountable;
- Specific actions to be achieved; and
- Budgetary and time constraints.

Business plans and action plans must remain living documents. Plans should be revisited and, if necessary, revised at least once a year.

New Mexico's Highway Operations Business Plan and Action Plans. In 2000, NMSHTD adopted a system of business plans and action plans to help the agency achieve the performance results identified in the Compass, which is the agency's performance management tool. Compass establishes 17 key results that measure Department-wide performance. Each of the agency's major groups is required to have a business plan. Within each group, action plans are required for individual work units. The Department's business plans and action plans are flexible documents that can be changed at any time.

Highway Operations, NMSHTD's largest group, includes construction, maintenance, and administrative support functions. The group is led by the Deputy Secretary for Operations, who is supported by six District Engineers and a Highway Operations Engineer. The Deputy Secretary is responsible for preparing a business plan,

with objectives that are linked to relevant Compass results, for each of the Highway Operations Group's major programs. For each objective, the plan identifies relevant Compass results, as well as the individuals with primary and secondary responsibility for achieving the objective. This business plan is then underpinned by a series of action plans for individual work units within construction, maintenance, and program support functions.

Executive-Level Office with Performance Measures Function
An executive-level work unit within the agency that has full responsibility for supporting organization-wide development and implementation of performance measures as a formal component of its duties is important.

The development and implementation of a performance measurement system involves many moving parts that require careful coordination. Just a few of the tasks that require day-to-day attention include measurement coordination and tracking, review of results, preparation of a regular results report, and business plan reviews. A Performance Measurement Office is needed to perform and coordinate these functions, and can play a critical role in reinforcing accountability for performance measurement and keeping forward momentum.

Making a performance measurement office an arm of the CEO's office is helpful. It gives the office appropriate visibility and credibility, reinforces leadership commitment to performance measures, and provides the high-level coordination needed to run an efficient and effective performance measurement program. It also is important to provide the office with sufficient resources and power to create a performance measures program. The office will require cross-cutting authority to influence the functions of the agency, but should not be overly directive or controlling. While staff of at least two or three personnel is required even in a small DOT, the staff may have other duties.

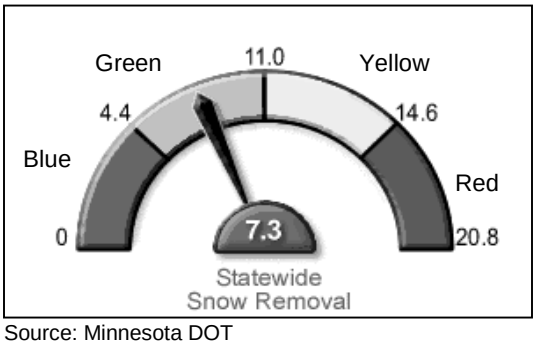
Kentucky. The Kentucky Transportation Cabinet's (KTC) Office of Quality oversees the agency's quality initiatives including strategic planning and performance measurement. This office ensures that processes needed for the quality management system are established, implemented, and continuously improved. Staff in the Office of Quality report to the CEO. The Office of Quality oversees the preparation of KTC's *Path*, which is a summary of performance measures and information established to gauge the Cabinet's delivery of products and services to its customers and to compare KTC's performance to other states in the Southeast.

5.2. Graphics for Communicating Results

Graphics can help communicate performance measure results more quickly and more clearly than data in tabular form. Many DOTs use visual techniques to communicate internally and externally.

Dashboards
Like an automobile dashboard, these visuals provide an array of useful information at a glance. The dashboard uses color to give a snapshot of how results compare to expectations. For example, in Minnesota, a dashboard is used to track Mn/DOT's snow removal performance. Blue indicates that targets are being exceeded; green indicates they are being met; and yellow and red indicate problems.

Figure 5.2. Mn/DOT Snow Removal Dashboard



Source: Minnesota DOT

In the above example, the dashboard is calibrated to show time required to reach bare pavement statewide. Minnesota also tracks performance at the District level and by class of road. Dashboards can be used

internally to track performance and externally to communicate results.

Trend Lines
The weakness of dashboards is that they provide information about a particular point in time. Departments of transportation often want to ensure progress over time as part of their performance measurement. In Washington, as part of its efforts to manage maintenance operations, WSDOT tracks trends in the volume of overtime hours. Just like dashboards, trend lines can be presented at a statewide level or broken down into sub-categories.

Reports
Some DOTs are compiling performance results information into a regular report, both for external and internal use.

A results report helps to foster both external and internal awareness about a DOT's performance measures. The regular schedule associated with reporting also helps to bring internal accountability and discipline to the performance management program, as employees must meet deadlines for providing updated tracking data. Most importantly, however, when performance results are known, they can be used to influence decision-making.

While the techniques used by individual DOTs to report results vary, a common theme is regular, clear, concise, and compelling communication of results. The content of a report will depend on its purpose. Information should be provided in a quantity and format suitable for the intended audience. This may require different reports for different audiences. For external audiences, for example, reporting may be provided in a highly polished document, while internal documents may be more informal.

Reports can be prepared as frequently as every quarter, but should be completed at least once a year. DOTs should ensure that procedures for updating the report are flexible enough to accommodate evolution in strategic performance measurement elements.

Washington State. At WSDOT, the CEO initiated a quarterly performance measures report called Measures, Markers, and Mileposts, also known as the Gray Book. It tracks a variety of performance and accountability measures for routine review by the Transportation Commission. The Gray Book also is continually evolving and has become an important source of information about Department performance for the CEO, state legislators and other agency stakeholders.

5.3. Institutionalizing Strategic Performance

The physical elements of a framework for performance measurement – a hierarchy of measures, a reporting mechanism, business plans, and so on – must be supported by an ongoing management commitment to institutionalizing performance management. There are some elements that deserve careful consideration:

- Encourage employee buy-in and accountability for measures;
- Provide regular review of results; and
- Allow flexibility in measures.

Encourage Employee Buy-In and Ownership
Employees must understand the need for and should be supportive of performance measures while appropriate senior staff should have clear ownership of and accountability for performance measures.

Negative attitudes or just a lack of awareness about performance measures by employees can cause performance management efforts to founder. Initially, buy-in on performance measures ensures that employees' perspectives help shape the selection and design of performance measures. Subsequently, employees that are involved in the measure development process are more likely to be invested in implementation and subsequent actions.

Key staff should have ownership of individual measures. Powerful incentives are created when measures are entrusted to appropriate owners who are expected to achieve performance goals. It forces them to

consider their work processes and the focus of their business plans and ensures that day-to-day work activities are focused towards addressing their measure(s).

Kentucky. When KTC began to revise its strategic planning and performance measures process in 2001, top management supported the effort, but there was some middle management and front-line staff resistance. Subsequently, KTC's performance measures staff has invested a considerable amount of time in meeting with all 12 District Offices and central office Divisions to gather their input. The result is that ownership of performance measures by staff has increased significantly.

Maryland. At Maryland SHA, the agency uses performance agreements to strengthen staff accountability. Each of the 27 senior managers in SHA has a performance agreement that is related to the agency's strategic objectives. Managers are given bonuses based on achievement of targets.

Pennsylvania. The Pennsylvania Department of Transportation has created measure owners who are responsible for high-level goals and the performance measures associated with them. Measure owners are senior staff.

Establish Regular Review of Results

A regular forum for reviewing performance measure results is needed since tracking performance measures can easily take second or third priority to activities of greater immediate importance and other regular work responsibilities, unless a regular reporting mechanism and schedule are established that help create accountability.

Performance measurement results are easy to ignore if no forum is established to discuss their implications. A regular review of measures helps reinforce employee accountability and buy-in, even fostering an atmosphere of competition among staff to achieve results and promotes cross-fertilization of ideas. Ultimately, review of performance measures allows senior management to identify performance problems or successes and to take appropriate responses to address them.

A senior management committee made up of measure owners should meet regularly to review measures. This committee may meet in conjunction with the publication of the agency's performance measures report. There are no hard and fast rules about how often reviews should occur, but every two to three months seems typical.

Reviewing an extensive array of performance measures can be time-consuming; therefore, it makes sense to focus on problem areas in review meetings. As a rule of thumb, it is wise to manage by exception, i.e. to focus on the problem areas and outliers rather than every single result.

Florida. The Florida Department of Transportation holds monthly meetings, attended by the Department's top 25 or so managers, where performance results are reviewed. The focus of the meeting is not on punishing bad behavior or repetitive listing of measures, but on identifying and addressing problem areas based on the data reviewed.

Louisiana. The LADOTD Secretary meets with the agency's assistant secretaries and other senior staff on a quarterly basis to review progress toward achieving assigned goals, objectives, and strategies. These reviews directly influence decisions about the reallocation of staff and resources.

Ensure Flexibility in the Roster of Measures

The CEO should be prepared to change individual measures in response to changing circumstances because performance measurement is an iterative process. Organizations should continually assess whether their current measures are sufficient (or excessive), benefit management efforts, and drive the organization in the right direction. When measures become obsolete, they should be discarded and, if appropriate, replaced.

Flexibility is fundamental to an effective performance measures implementation framework. The CEO must be able to change the set of measures as appropriate. Some performance measures may only have a short-term purpose and can be discarded when the issue of concern is addressed. Long-term measures may prove

ineffective in meeting desired uses and should be dropped or revised. Additionally, many DOTs find that they begin with too many measures and need to reduce the array of measures tracked at each organizational level.

New Mexico. One of NMSHTD's measures is "percent of state population in incorporated areas with access to a four-lane divided highway." The results for this measure are now at 96 percent and agency management has agreed that this measure is no longer needed.

Section 6:

Final Observations

This section distills the experiences of eight leaders in strategic performance measurement into a set of vital measures that every CEO should pay close attention to. It addresses, in general terms, approaches for measuring common, but important, agency-wide functions. A word of caution to readers – the list focuses on a vital few measures, but in any state there are likely to be other measures that are regarded as essential and that reflect unique responsibilities, organizational structure, resources, and stakeholder expectations. The list should be considered as a starting point for a journey – not a set of benchmarks against which all DOTs should be judged!

Importance of Customer Satisfaction

Customer satisfaction is an issue that cuts across every category of measures. In any state DOT, overall customer satisfaction should be a driving force in strategic management efforts and can provide a useful indication of whether the agency is moving in the right direction. In Louisiana, for example, the DOTD focuses on improving the agency's overall image and credibility with a short-term, two-year goal of attaining 60 percent customer satisfaction. While overall customer satisfaction is important, measuring satisfaction in individual major areas of importance also is helpful. In Pennsylvania the DOT is evaluated and receives a grade of A through F in each of seven strategic focus areas, based on the results of customer surveys. Finally, customer concerns also should be taken into consideration in design of measures, to ensure they address issues that customers actually value and not necessarily what the DOT thinks is important!

System Preservation and Maintenance

Most DOTs invest significant resources to preserve the quality and usability of their highways and bridges. Many DOTs already collect a lot of data in this area that can be readily adapted for performance measurement purposes. Performance measures include:

- Pavement Conditions – these can be measured based on ride quality (i.e., IRI), or they can be a broader index that measures both surface conditions and pavement health; and
- Bridge Conditions – The Federal Highway Administration's (FHWA) bridge sufficiency rating can be universally applied to facilities in every state. States can focus on the percent of bridge deck areas rated above or below a certain level to improve the meaningfulness of the measure.

Safety

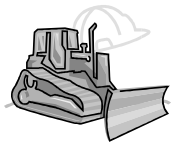
The number of highway accidents leading to fatalities or serious injuries has been, and will continue to be, a primary concern for DOTs. While some DOTs may wish to include measures that focus on specific problems (e.g., railroad crossings or seatbelt use), any strategic management approach should include the following measures in some form:

- Fatality Rates – fatalities per million vehicle miles traveled; and
- Crash Rates – crashes per million VMT.

Mobility, Congestion, and Access

Despite the obvious importance of addressing capacity-related goals, DOTs continue to struggle with mobility and access performance measures that are meaningful and practical. A uniform set of measures in this area is unlikely. One problem is the lag between actions and performance. Another issue is the degree to which non-DOT actions can influence results (e.g., economic trends and land use patterns). Still another challenge is that mobility, congestion, and access mean different things in different states. With that said, the most frequently used measures in this area include:

- Temporal and Spatial Trip Reliability **–** while customers do not like congestion, they are also concerned with trip predictability, particularly during rush hour periods in urban areas;
- Statewide and Regional Accessibility – particularly in rural areas, improving citizen access to the state system is important; related measures can assess the percent of population within a certain number of miles from the system or the percent of communities connected by the system;
- Spatial and Temporal Delay – total or average daily vehicle hours of delay is used by some states as a measure of congestion; and
- Other Measures - addition of new capacity in congested corridors and implementation of measures to address congestion.



Project Delivery

This goal area focuses on how efficiently and effectively a DOT goes about one of its core business activities. Several DOTs, as well as FHWA, do not consider this as an independent goal area; instead, it is viewed as a means to accomplishing other strategic goals. For example, some states include measurement of their project development efficiency and effectiveness under a mobility and access goal. States that want to make project delivery an independent goal area should consider the following measures:

- Project Scheduling – measures can focus on average project development times or deviations between planned and actual project schedules; and
- Project Costs – measures can focus on average costs per lane mile, deviations between planned and actual project schedules, or additional costs due to change orders (to name a few).

Operations

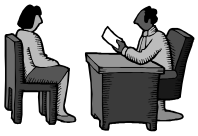
All DOTs view maintenance and operations as critical functions, but the goal area covers a wide range of DOT responsibilities – anything from snow removal and mowing to sign replacement and fixing potholes. Thus, establishing a common set of measures in this area is difficult. In large part, the critical measures are determined by a state's operating environment and stakeholder values and thus should be unique to an individual state. Some common measures include:

- Maintenance Activity Inputs and Outputs – most DOTs will likely wish to track key maintenance activities; such as snow removal, trash pick up, rest area cleanliness, animal carcass removal, and signage adequacy; and
- Customer Satisfaction – as potential proxy measure for any maintenance and operations activities.

Environment

Most DOTs consider environmental protection an important goal, but environmental goals and measures are handled differently across states. Some DOTs focus on the efficiency and effectiveness of environmental processes; other DOTs look at environmentally-based outputs or outcomes; and still others incorporate environmental measures into

other goal areas such as customer satisfaction, administration, or mobility.



Organizational Excellence

Several DOTs include a goal area that addresses the quality of their organization, although the range of considerations widely varies from agency to agency. Some states exclusively focus on human resources issues through measures that cover training and development, recruitment and retention, and employee satisfaction. Other states include business processes under this goal area and use measures such as those identified under project delivery.

Conclusion

No single set of performance measures can meet every state DOT's strategic performance measurement needs. The evidence presented in this guidebook, however, suggests that a tailored package of performance measures in each of the major issue areas described in this chapter can help CEOs use performance measurement to strengthen their strategic planning efforts by enhancing external communication with stakeholders and customers, reinforcing internal organizational direction, and supporting decision-making. Frameworks for implementation are critical to ensuring success. Inevitably, these implementation frameworks vary from state to state, but active CEO leadership is at the core of every good framework.

Appendix A:

Compendium of Selected States' Strategic Performance Measures

Note: During the preparation of this guidebook, eight state DOTs' performance measures programs were reviewed, including those in Florida, Kentucky, Louisiana, Maryland, Minnesota, New Mexico, Pennsylvania, and Washington. This appendix contains a listing of the individual performance measures that each of the eight states indicated they use for strategic management purposes. This listing draws on strategic planning and performance measurement documents and material provided by each state. It should not be considered a comprehensive list of every single measure used in each state.

Florida[1]

Summary:	
Number of strategic goals:	**2**
Number of focus areas:[2]	**5**
Number of strategic performance measures:	**12**

1. Strategic Goal – Preserve and Manage a Safe, Efficient Transportation System

1.a. Focus Area – System Preservation

- Percent share of pavement on the State Highway System that meets Department standards
- Percent share of FDOT-maintained bridges that meet Department standards, while keeping all FDOT-maintained bridges open to the public safe.
- Percent share of the acceptable maintenance standard on the State Highway System

1.b. Focus Area – System efficiency

- Deployment of Intelligent Transportation System technology on critical state corridors
- Reduction in the number of commercial vehicle crashes on the State Highway System

2. Strategic Goal – Enhance Florida's Economic Competitiveness, Quality of Life, and Transportation Safety

2.a. Focus Area – Mobility/economic competitiveness

- Rate of change in person hours of delay on the Florida Intrastate Highway System
- Percentage share of the highway capacity improvement program used for capacity improvements on the Florida Intrastate Highway System
- Transit ridership growth compared to average rate of population growth

2.b. Focus Area – Safety

- Highway fatality rate on all public roads per 100 million vehicle miles traveled
- Fatality rate on the State Highway System per 100 million vehicle miles traveled
- Bicycle fatality rate per 100,000 population
- Pedestrian fatality rate per 100,000 population

[1] Florida Department of Transportation. Short Range Component: FDOT Plan to Implement the 2020 Florida Transportation Plan – Linkage with the 2020 FTP and the Department's Strategic Objectives. January 18, 2002.
[2] No quantitative measures developed for "Quality of Life" focus area.

Kentucky

Summary:	
Number of goals:	**4**
Number of focus areas:	**19**
Number of strategic performance measures:	**27**

1. Goal – Ensure Mobility and Access

1.a. Preserve the transportation system infrastructure

- Rideability index – statewide
- Rideability index – districts
- Rideability index for new pavements
- Pavement preservation needs
- Percent structurally deficient bridges
- Percent functionally obsolete bridges
- Bridge condition
- Maintenance rating program

1.b. Improve transportation safety

- Fatal accident rate

1.c. Improve traffic flow and freight movement

1.d. Improve motor vehicle licensing and permitting services to customers

- Percent trucks meeting safety criteria

2. Goal – Support Economic Development

2.a. Improve and expand Kentucky's transportation systems

2.b. Enhance intermodal freight capabilities

2.c. Promote sound environmental practices in Cabinet projects and activities

- Exceedence of air quality standards

2.d. Support all modes of passenger transportation

- Public transportation ridership statewide
- Human service transportation delivery

3. Goal – Continually Improve Organizational Performance

3.a. Attract, develop, involve, and retain qualified people

- Employee satisfaction
- Employee turnover rate
- Absenteeism
- OSHA recordable incident rate
- Lost workdays
- Workers compensation claims

3.b. Integrate strategic planning and quality

3.c. Organize and manage resources

- Strategic use of federal funds
- Administrative cost as a percent of total expenditures
- Percent highway use tax collected

3.d. Deliver projects on-time and within budget

- Percent project lettings versus planned
- Project phases authorized on time
- Actual phase cost versus six year plan
- Original construction contract time versus actual

3.e. Continually improve operational and support processes

3.f. Use technology to improve organizational effectiveness and efficiency

4. Goal – Strengthen Customer and Stakeholder Relationships

4.a. Use a systematic approach to listen to customers

- Customer satisfaction

4.b. Plan and coordinate communication to customers and stakeholders

4.c. Promote quality management to external audiences

4.d. Encourage and support employee community involvement

4.e. Continually incorporate strong ethical standards in everything we do

Louisiana

Summary:	
Number of strategic goals:	**6**
Number of objectives	**50**

1. Strategic Goal – Planning: Provide strategic direction for a seamless, multimodal transportation system and for the State's water resources

- Update Long Range Transportation Plan and develop an implementation plan by FY 04
- Streamline planning and environmental process by FY 04
- Develop a plan to improve intermodal connectors by FY 04
- Prepare a statewide plan for development of the State's water resources by FY 07

2. Strategic Goal – Management: Foster institutional change for the efficient and effective management of people, programs and operations through innovation and deployment of advanced technologies

- Attract, develop, and retain a qualified, motivated, and diverse workforce to reduce the overall vacancy rate to 1% or less by FY 04
- Improve productivity by streamlining processes, utilizing advanced technologies, and implementing productivity tools; complete 80% of the DOTD 5-year Enterprise Information Architecture milestones by FY 06
- Improve DOTD image and credibility by exceeding responding to customer expectations and attaining 60% customer satisfaction by FY 05

3. Strategic Goal – Safety: Provide a safe transportation and flood control system to protect lives and property

- Enhance aviation safety by reducing number of major safety violations 5% per year
- Reduce injury crash rate (fatal and non-fatal) on highways by 4% per year
- Enhance the flood control program by producing a plan to reduce the unfunded need by 10% per year beginning July 2005
- Implement 100% of the recommendations of the South Louisiana Hurricane Evacuation study of July 2001
- Expedite railroad crossing improvement program by improving/closing 40 highway railroad crossings per year
- Improve work zone safety by reducing crash rate 10% per year on Interstate construction projects
- Enhance safety guidance/procedures for Public Transportation Vehicle Safety Program by reducing reportable accidents involving property/equipment to less than 20 by June 2006

- Enhance safety for rail fixed guideway systems to reduce accidents involving property/equipment to less than 5 by June 2003

- Increase participation in Federal Emergency Management Agency (FEMA) Community Rating System (CRS) to 81% of policyholders receiving insurance rate reductions by June 2006

- Reduce crash rates by 10% at sites where safety improvements have been implemented

- Enhance safety for rail fixed guideway systems to reportable injuries involving passengers/public by less than 10 by June 2003

- Enhance aviation safety with ultralight aircraft to ensure continued 0 fatalities by June 2003

- Enhance safety for rail fixed guideway systems by reducing/maintaining reportable fatalities involving passengers/public to 0 by June 2003

4. Strategic Goal – System Preservation: Preserve the state transportation and water resources infrastructure

- Reduce the percentage of deficient bridge deck areas by 1% per year

- Eliminate the percentage of miles on the Interstate Highway System in less than fair condition in five years

- Reduce the percentage of miles on the National Highway System with poor pavement so that no more than 5% is in less than fair condition in five years

- Reduce the percentage of miles on the State Highway System with poor pavement so that no more than 5% is in less than fair condition in five years

- Perform routine maintenance to achieve 85% customer satisfaction by FY 04

- Develop and implement a maintenance management system by July 2005

- Develop and implement a procedure for reducing the number of miles in the state system to 15,000 by FY 06

- Develop and implement a management system for water resources infrastructure preservation by June 2006

- Develop and implement a maintenance management system for fleet of Federal Transit Administration funded vehicles by June 2006

- Enhance infrastructure at public-owned general aviation airports by increasing average Pavement Condition Index to 70 by June 2005

- Enhance infrastructure at public-owned general aviation airports by increasing number of lighting systems meeting state standard by 2 per year

5. Strategic Goal – Operations: Provide for the effective and efficient operation of the transportation network and water resources systems

- Reduce travel time variability on urban area freeways and arterial segments by 10% in metropolitan areas by January 2005
- Develop and implement an environmental management plan for DOTD facilities and infrastructure to reduce environmental permit violations by 10% per year for 4 years
- Improve DOTD rest areas by implementing an asset management plan by June 2005
- Develop and implement a sign management plan to achieve 0% freeway sign retroreflectivity not within specification limits in 4 years
- Reduce traffic signal installation/upgrade backlog to 2 months by July 2006
- Implement Automated Vehicle Identification and Weight In Motion systems at all interstate weigh stations by FY 04
- Enhance operational aids at public-owned general aviation airports by increasing number/quality of available radio/electronic pilot aids by 4 per year.
- Achieve an accuracy rate for toll collectors of not less than 98%
- Manage bridge operations at operating cost per vehicle of no more than $0.25
- Improve toll tag usage rate to 60%
- Maintain ferries to ensure operation downtime during scheduled operating hours does not exceed 10%
- Manage ferry operations at operating cost per passenger of no more than $2.00

6. Strategic Goal – Mobility and Access: Improve transportation mobility and access

- Accelerate completion of the TIMED Program by developing and implementing a feasible plan by January 2003
- Reduce the rate of increase (average over 3 years) in congested miles to less than 10% per year on the National Highway System
- Through the Port Priority Program, maintain state's strong position as a load center for international and domestic cargo as measured by total cargo and total value
- Improve and expand transit systems to provide increased mobility of Louisiana's citizens in 44 parishes with full or partial coverage by June 2006
- Retain, expand, and/or improve Louisiana's passenger/commuter and freight rail service by decreasing number of parishes with limited or no freight railroad service
- Reduce rate of increase (3 year average) in congested miles to less than 5% on the Statewide Highway System
- Retain, expand, and/or improve Louisiana's passenger/commuter and freight rail service by decreasing number of parishes with no passenger/commuter rail service

Maryland[3]

Summary:	
Number of strategic direction elements:	**8**
Number of policies:	**25**
Number of strategic performance measures:	**About 80**

1. Mobility

1.a. Goal – Reduce the time it takes to restore normal traffic flow along state highways after incidents occur

- Date baseline data collection methodology implemented
- Percentage reduction in average response time
- Percentage reduction in average clearing time

1.b. Goal – Provide timely and reliable highway information to the traveling public

- Number of cumulative CHART/ITS devices installed
- Number of regional Traffic Operations Centers integrated with CHART
- Percentage of cameras that are media accessible
- Percentage of cameras available to the traveling public via the Web
- Complete real-time construction and weather related lane closure information via the Web

1.c. Goal – Enhance mobility through improved inter-modal coordination and connections

- Percentage of projects that are intended to enhance intermodal connections advertise within fiscal year
- Number of users of State Highway Administration park-and-ride lots
- Percentage of centerline miles along urban state roads within 0 .6 miles of a transit station that have sidewalks
- Complete website linkage by June 2003

1.d. Goal – Reduce recurring congestion at priority locations

- Percentage of projects intended to reduce recurring congestion advertised within the fiscal year

[3] Maryland State Highway Administration. Internal Document.

- Percentage of projects intended to optimize traffic signal systems performance completed within the fiscal year

- Date methodology for measuring change in delays for projects intended to address recurring congestion implemented

2. Highway Safety

2.a. Goal – Provide a safe state highway system

- Percentage reduction in fatal and injury accident rates on state highways

- Percentage reduction in number of pedestrians fatalities and injuries on state highways

- Percentage reduction in the number of bicyclist fatalities and injuries on state highways

- Percentage reduction in motor carrier fatality and injury rates on state highways

3. System Preservation

3.a. Goal – Improve the overall condition of SHA's bridges

- Percentage reduction in the number of structurally deficient bridges on the Maryland State Highway System

- Percentage of structurally deficient bridges on Maryland's portion of the National Highway System compared to the national level

3.b. Goal – Improve the ride quality of the SHA's pavement network

- Percentage of roads with an acceptable ride quality

- Percentage of Maryland's National Highway System mileage with acceptable ride quality

3.c. Goal – Increase the durability of the SHA's pavement network

- Average service life of State Highway Administration pavements

4. Economic Development

4.a. Goal – Provide a highway system that supports Maryland's economy

- Percentage of programmed economic development projects advertised within the fiscal year

- Documented methodology to measure economic impact of highway projects

- Percentage of policies reviewed and updated

5. Community Enhancement

5.a. Goal – Support Smart Growth and enhance quality of life in our communities

- Percentage of Neighborhood Conservation and Urban Reconstruction, bicycle retrofit, and sound barrier projects advertised within the fiscal year
- Number of new miles of State Highway Administration advertised roadway that are bicycle compatible
- Percentage of sidewalk, TEA-21 Enhancement, and TEA-21 recreational trails funds programmed each fiscal year
- Percentage of eligible urban highway mileage with sidewalks
- Results from Qualities and Characteristics Evaluation Tool

6. Environmental Stewardship

6.a. Goal – Develop and maintain Maryland's highways in an environmentally responsible manner

- Amount of acreage reduction of Canadian thistle per year
- Date Maryland's streamlining procedures distributed
- Number of acres of wetlands restored per year
- Date best practices document completed
- Number of interagency funding agreements established by June 2002
- Number of SHA, environmental agency, and consultant staff attending streamlining process training sessions
- Percentage of SHA construction projects achieving erosion and sediment control ratings of A and/or B
- Date environmental stewardship initiative completed
- Acres of wetlands created and reforestation planted compared to acres required
- Percentage of environmental commitments met for advertised projects each fiscal year
- Number of stormwater management enhancements completed compared to the number targeted
- Completion of stormwater management pilot project, as part of NPDES implementation by December 2002

6.b. Goal – Enhance the appearance of Maryland's State highways

- Number of acres of wildflowers seeded annually

- Number of miles of state highway adopted on December 2002
- Percentage increase in miles adopted on December 2002

7. Customer Service

7.a. Goal – Provide products and services to our customers that meet or exceed their expectations

- Percentage of external customer survey responses rating State Highway Administration's performance at B or better
- Percentage of rest areas with peer review rating of B or better
- Percentage of CTP follow-ups completed within 2 weeks of each CTP Tour meeting
- Number of employees trained in new customer service training by January 2004
- Percentage of senior managers with employee survey improvement plans

8. Managing Our Resources

8.a. Goal – Improve workplace safety in our work environment

- Percentage reduction in injury rate
- Quarterly reporting safety performance measures statewide
- Date updated handbook ready for distribution
- Number of workplace injuries statewide
- Number of lost work days due to injury

8.b. Goal – Meet annual budget targets

- Percentage of budget expended

8.c. Goal – Make prompt payment to our vendors

- Percentage of invoices paid on time

8.d. Goal – Improve State Highway Administration's business planning process

- Number of employees who have received training
- Percentage of offices and districts with completed business plans
- Percentage of offices and districts using MFR measurements to assist in managing their operations

8.e. Goal – Achieve a State Highway Administration workforce that reflects the same diversity as Maryland's labor force

- Percentage of representation in SHA's workforce categories

8.f. Goal – Support the Smart Growth initiative by promoting and sponsoring teleworking by appropriate staff

- Percentage of eligible employees teleworking

8.g. Goal – Improve employee skills and performance

- Date all employees trained
- Number of employees who have an annual development plan as part of their performance evaluation

8.h. Goal – Improve overall bid opening process

- Percentage of bids opened on date specified in bid proposal
- Average number of days between bid and notice to proceed

8.i. Goal – Improve the quality of projects through partnering

- Number of construction contracts with partnering agreements
- Percentage of project rating forms rating each construction key performance at 3 or better
- Date implementation plan incorporating partnering principles and methods in the project development process developed

8.j. Goal – Reduce additional construction costs

- Reduction in average change order percent
- Percentage of major projects advertised with cost estimates 5% or more above the estimate when funded for construction

8.k. Goal – Maintain a full complement of staff to ensure the achievement of SHA's mission

- Vacancy rate percentage
- Number of position vacant for 12 months or more

8.l. Goal – Conduct a review of SHA's engineering recruitment and retention plan and implement strategies that will improve competition for graduate engineers by January 2004

- Date recruitment and retention plan reviewed
- Number of graduate engineers hired/number of vacancies
- Number of graduate engineers retained

8.m. Goal – Ensure SHA's public services and information are available through the internet consistent with the requirements of e-Gov statute

- Percentage of eligible public services and information available through the internet

Minnesota[4]

Summary:	
Number of strategic direction elements:	**3**
Number of policies:	**8**
Number of strategic performance measures:	**24**

1. Strategic Direction – Safeguard What Exists

1.a. Preserve essential elements of existing transportation systems

- Percent of miles of pavement that meet good and poor ride quality targets – PSR (principal arterials and IRCs)
- Remaining service life of pavement, based on PSR
- Percent of Regional Trade Center (0-3) airport runways whose pavement condition meets targets
- Percent of bridges that meet good and poor structural condition targets (principal arterials and IRCs)

1.b. Support land use decisions that preserve and enhance the safety of transportation systems

- No measures selected as top-level measures for 2004 – 2005 business plan

1.c. Effectively manage the operation of existing transportation systems to provide maximum service to customers

- Variability in peak period travel time
- Clearance time for incidents, accidents, or hazmats (metro)
- Snow and ice removal clearance time

2. Strategic Direction – Make the Network Operate Better

2.a. Provide transportation options for people and freight

- Bus service hours
- Percent of major generators (ports, terminals, etc.) with appropriately designed roadway access to IRCs or water and/or rail access to rail/water corridors

[4] Minnesota State Transportation Plan measures proposed as Department or Group measures for 2004-05 Business Plan. May 14, 2002.

2.b. Enhance mobility in interregional transportation corridors linking Regional Trade Centers

- Percent of IRC miles meeting speed targets
- Variability in peak period travel time

2.c. Enhance mobility within major regional trade centers

- Ratio of peak to off-peak travel time (Travel Rate Index)
- Variability in peak period travel time
- Hours and miles of congestion per day (TC urban freeway)

2.d. Increase the safety and security of transportation systems and their users

- Crashes per million vehicle miles (Trunk highways 3-year average)
- Total crashes at at-grade railroad crossings (3-year average)
- Total general aviation crashes (3-year average)
- Fatalities per year (all modes 3-year average)

3. Strategic Direction – Make Mn/DOT Work Better

3.a Continually improve Mn/DOT's internal management and program delivery

- Percent of projects open to traffic within 5 years
- Percent of projects in 1st year of current STIP let in the year
- Overall system performance on a 10 point scale
- Percent of Minnesotans who view Mn/DOT as a reliable source of information
- Customer satisfaction with traveler information – before and during trip
- Composite score on targets for a) time to fill vacancies, b) quality of hires, c) retention, and d) diversity

New Mexico[5]

Summary:	
Number of results:	**16**
Number of measurements:	**86**

1. Result – Smooth Roads to Provide Safe, Efficient Travel

- Ride quality index for Interstates and non-Interstates
- Project profilograph for new construction

2. Result – Safe Transportation System/Reduction in Vehicle Crashes

- Fatalities per 100 million vehicle miles traveled
- Serious injuries per 100 million vehicle miles traveled
- Alcohol involved fatalities
- Alcohol involved fatalities per 100 million vehicle miles traveled
- Alcohol involved fatalities per 100,000 population
- Alcohol related fatalities to total fatalities
- Run-off road crashes to total fatalities
- Head-on crashes per 100 million vehicle miles traveled
- Seatbelt use by the public
- General and auto liability claims and insurance premiums
- Statewide rural crashes involving heavy vehicles
- Railroad/highway grade crossing accidents

3. Result – Access to Divided Highways

- Divided highway miles in good condition
- Incorporated areas served by divided highways

4. Result – Intermodal facilities

- Number of intermodal facilities
- Rail freight tonnage originating in New Mexico

[5] New Mexico State Highway and Transportation Department. Compass. 1st Quarter 2002

- Rail freight tonnage terminating in New Mexico
- Air freight tonnage enplaned and deplaned
- Airport improvement projects
- Air Service Assistance Program

5. Result – Adequate Funding and Prudent Management of Resources

- Comparison of contractual services to agency budget
- System-wide highway miles by condition
- Six year STIP funding compared to needs
- Time from final project completion to submittal of final payment
- Ratio of operations to administration budget
- Ratio of construction to maintenance budget
- Recovered property damage claims
- Bridge replacement: deck area and costs
- Number of annual audit findings and percent resolved by independent audit

6. Result – Less Traffic Congestion and Pollution

- Percentage of roads with a high volume to capacity ratio
- Highest average readings of EPA air quality standards

7. Result – Maintenance of Highways and Facilities

- Number of miles in Adopt-a-Highway program
- Shoulder miles of litter pick-up
- Square feet of graffiti removal
- Number of permanent road signs added or upgraded
- Customer satisfaction at rest areas
- Number of statewide improved pavement surface miles
- Maintenance expenditures per centerline mile of combined system-wide miles

8. Result – Improved Communication, External

- Media coverage
- Public involvement with the project development process

- Environmental responsibility
- Feedback on warrants
- Public use of Department's websites

9. Result – Cost Effective, Quality Transportation Systems

- Interstate construction cost per lane mile
- Non-Interstate/National Highway System construction per lane mile
- Number of change orders by type
- Return on investment for value engineering projects

10. Result – Employees

- Quarterly and annual comparison of sick leave hours used to total hours available
- Comparison: sick hours used by other agencies with over 1000 FTEs
- Quarterly comparison of turnover rate by District/GO cumulative
- Number of employees certified
- Appraisal development plans completed on time
- Number of worker's compensation claims and cost
- Rating from employee satisfaction survey
- Training hours completed by employees by districts and divisions

11. Result – Increased Transportation Alternatives

- Public transit ridership
- Public transit vehicle revenue miles
- Number of rideshare enquiries and matches
- Welfare to Work transportation ridership
- Measurement – Annual number and revenue for aircraft registration

12. Result – Timely Completion of Construction/Maintenance Projects

- Average day cost by contract
- Innovative construction contracting
- Projects with liquidated damages

13. Result – Realistic Statewide Transportation Improvement Program

- Number of programmed projects let
- Dollar amount of programmed projects let
- Actual bids versus programmed amounts
- Bid amount within 10% of engineer's estimate
- Actual cost versus low bid amount
- Programmed cost versus actual cost
- Aviation Program Capital Improvement Program – needs compared to funding

14. Result – Economic Benefits to New Mexico

- Number of high paying jobs
- Number of licensed businesses

15. Result – State Letting Schedule

- Projects let as scheduled, three months
- Projects let as scheduled, six months
- Projects let as scheduled, one year
- Federal-aid limitation/cumulative obligation
- State Program cumulative average budget and obligation

16. Result – Transportation Leader

- Number of public appearances
- Participation at commission meetings
- Number of partnering agreements
- Number of external awards received by Department and staff
- Customer use of research funding

Pennsylvania[6]

Summary:	
Number of strategic focus areas:	**8**
Number of high-level goals:	**14**
Number of strategic performance measures:	**15**

1. Strategic Focus Area – Maintenance First

1.a. High Level Goal – Smoother roads

- IRI for major National Highway System highways

1.b. High Level Goal – Cost effective highway maintenance investment

- Outstanding maintenance needs using highway and bridge asset management system (to be completed)

2. Strategic Focus Area – Quality of Life

2.a. High Level Goal – Balance social, economic, and environmental concerns

- Percentage share of highway project environmental approvals that are on time

2.b. High Level Goal – Demonstrate sound environmental practices

- Implementation of ISO 14001 environmental criteria (2002) and meeting of ISO standards (2005)

3. Strategic Focus Area – Mobility and Access

3.a. High Level Goal – Delivery of transportation products and services

- Was 12-year program commitment of $1.3 billion in construction program contracts in 2002 and $1.4 billion in 2005 met?

3.b. High Level Goal – Efficient movement of people and goods

- Reduction in peak period work zone lane restrictions
- Reduction in travel delays in selected corridors (target to be set)

4. Strategic Focus Area – Customer Focus

4.a. High Level Goal – Improve customer satisfaction

- Average Department-wide Baldridge score for customer criteria

[6] Pennsylvania Department of Transportation. DRAFT PennDOT Vision, Mission, Values, Strategic Focus Areas, High Level Goals, and Strategic Objectives. May 23, 2002; and PennDOT Scorecard July 17, 2002. Summary table applies to PennDOT Scorecard. The SMC Scorecard that includes 23 strategic objectives has several additional strategic performance measures.

4.b. High Level Goal – Improve customer access to information

- Percentage of calls to Customer Call Center answered

5. Strategic Focus Area – Innovation and Technology

5.a. High Level Goal – World class process and product performance

- Baldrige organizational review package scores

6. Strategic Focus Area – Safety and Security

6.a. High Level Goal – Safer travel

- Reduction in fatalities per year

6.b. High Level Goal – Safer working conditions

- Reduction in injury rate per 100 employees

6.c. High Level Goal – Improve transportation security

- Establish statewide security plan and action items

7. Strategic Focus Area – Leadership at All Levels

7.a. High Level Goal – Improve leadership capabilities and work environment

- Share of positive rating in organizational climate survey

8. Strategic Focus Area – Relationship Building

8.a. High Level Goal – Cultivate effective relationships

- PennDOT partner business effectiveness survey scores (to be developed)

Washington[7]

Summary:

Number of issues: **17**
Number of measurements: **NA**

Note: WSDOT does not have a traditional strategic plan. WSDOT publishes a quarterly "Measures, Markers, and Mileposts" report that identifies measures of performance. The measures vary from quarter to quarter .The measures described below have been used in at least two quarterly reports, providing a rough indication of measures that WSDOT has found value in.

1. Aviation

- None reported more than one quarter

2. Bridge Conditions on State Highways

- Deck protection projects: planned versus actual projects
- Inventory of WSDOT bridges
- Seismic retrofit program: planned versus actual projects
- Steel bridge painting: planned versus actual projects

3. Commute Trip Reduction

- Park-and-ride lot occupancy rates: King County
- Vanpool operation in the Puget Sound Region

4. Congestion on State Highways

- Daily vehicle hours of delay per mile
- Sample commutes measured by delay
- Time of day distribution of delay
- Travel Rate Index

5. Construction Program for State Highways

- Advertisements by subprogram: planned, actual, and deferred
- Asphalt concrete pavement delivery
- CIPP value of advertised and deferred projects by subprogram

[7] Washington Department of Transportation. Gray Book. Multiple Quarters.

- Construction program cash flow: planned versus actual expenditures
- Construction program delivery: planned versus actual advertisements
- Safety construction program: planned versus actual advertisements

6. Design

- None reported more than one quarter

7. Environmental Stewardship

- Protecting streams from construction site erosion and runoff

8. Ferries

- Construction program expenditures: planned versus actual
- Customer comments
- Farebox revenues by month
- On-time performance
- Ridership by month
- Trip reliability index and trip cancellation causes

9. Maintenance of State Highways

- Achievement of biennial maintenance targets (MAP)
- Highway sign bridges: planned versus actual repairs
- Litter removal from state highways
- Pavement striping: planned versus actual miles painted
- Snow and ice control operations

10. Pavement Conditions on State Highways

- Determining pavements due for rehabilitation

11. Rail Freight

- Grain train carloads

12. State-Supported Amtrak Service

- Customer satisfaction
- On-time performance

- Ridership by month
- Ridership by year: long-term trends

13. Safety on State Highways

- Fatal and disabling crashes and VMT, percent change
- Fatality rates: state highways, all state public roads, and U.S.
- Low cost safety enhancement program: planned versus actual projects
- Safety construction program: planned versus actual project advertisements

14. Traffic Operations on State Highways

- Incident response times and clearance times

15. Traveler Information

16. Truck Freight

17. Workforce

- Accident prevention activities
- Ferry vessel workers recordable injuries
- Highway engineer workers recordable injuries
- Highway maintenance workers recordable injuries
- Highway maintenance workers safety training
- Workforce levels

Appendix B: Selected Additional Reading

Albertin, R. et al., *Facilitating Transportation Agency Management Through Performance Measurement: The NYSDOT Experience with the Management Performance Indicators Report*, Transportation Research Record 1498 (1995).

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Poister, T.H., *Performance Measurement in State Departments of Transportation, A Synthesis of Highway Practice*, NCHRP Synthesis 238, Transportation Research Board (1997).

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Appendix C: List of Acronyms & Abbreviations

CEO	Chief Executive Officer
CHART	Coordinated Highway Action Response Team
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FIHS	Florida Interstate Highway System
FTP	Florida Transportation Plan
IRC	Interregional Corridor (Minnesota Department of Transportation)
IRI	International Roughness Index
ITS	Intelligent Transportation Systems
KTC	Kentucky Transportation Cabinet
LADOTD	Louisiana Department of Transportation and Development
MDOT	Maryland Department of Transportation
Mn/DOT	Minnesota Department of Transportation
NCHRP	National Cooperative Highway Research Program
NHS	National Highway System
NMSHTD	New Mexico State Highway Transportation Department
OSHA	Occupational Safety and Health Administration
PennDOT	Pennsylvania Department of Transportation
SHA	Maryland State Highway Administration
SOV	Single Occupant Vehicle
STIP	Statewide Transportation Improvement Plan
TEA-21	Transportation Equity Act for the 21st Century
TRB	Transportation Research Board
VMT	Vehicle Miles Traveled
WSDOT	Washington State Department of Transportation